

a yellower tint (dark orange). The wings are coloured as in the female.

The ventral segments are simple. In the antennæ the last joint is moderately curved, narrowed to the apex, and obliquely truncated; it is hardly as long as the penultimate joint. The intermediate joints, especially 7 and 8, are somewhat flattened and dilated, widest in the middle of each joint (seen from above joints 7 and 8 are pentagonal). The third joint is about as long as the fourth and fifth together.

The sides of the thorax near the insertion of the abdomen run out into conspicuous blunt and flattened (not spine-like) productions. In the tridentate apical ventral segment the middle spine is extremely long as compared with the two lateral ones, so that, without relaxing the insect and drawing this segment right out, one might almost mistake it for a *Sphecus*.

Woking, Nov. 1903.

LXIII.—Notes on some *Medusæ* from Japan.

By R. KIRKPATRICK, F.Z.S.

[Plate XXXIII.]

A small collection of *Medusæ* made in the Inland Sea, Japan, by Mr. R. Gordon Smith was sent by him to the Natural History Museum. The specimens, eight in number, represent three genera and species; of these, one genus and one species have not hitherto been described. The following is a list of the species:—

LEPTOMEDUSÆ: *Gonomeandrus chrysostephanus*, gen. et sp. n.

TRACHOMEDUSÆ: *Gonionemus Agassizii*, Murbach and Shearer.

DISCOMEDUSÆ: *Aurelia aurita*, Linn., var. *japonica*, Kishinouye.

LEPTOMEDUSÆ.

Family Cannotidæ, Haeckel.

Subfamily POLYORCHIDÆ, A. Agassiz.

GONOMEANDRUS\*, gen. nov.

*Polyorchidæ* with four radial canals, each with an unbranched transversely meandrine proximal portion, situated on a gastric peduncle, and with a pinnately branched distal portion on the wall of the subumbrella, the branches ending

\* Μαίανδρος, the river Meander; γόνος, seed.

blindly; with four main branched interradial centripetal canals, and a few adradial twigs given off from the circular canal and ending blindly. Gonads situated on the proximal portion of the radial canals, and forming transversely folded lamellæ.

*Gonomeandrus chrysostephanus* \*, sp. n.  
(Pl. XXXIII. figs. 1-4.)

Umbrella cylindrical, about  $1\frac{1}{4}$  times as high as broad, slightly contracted below, with rounded summit, and with the lower margin divided into eight adradial rounded lobes. Gastric peduncle cuboidal, with a slender stalactitic prolongation at some (or all) of its radial angles.

Stomach quadrangular, expanding down to a wide square mouth with slightly frilled margin.

Circular canal with eight loops, corresponding to the marginal lobes.

Tentacles rather short, in one series, about 80 to each lobe (or 640 in all), hollow, cylindrical, and studded with nematocyst warts in the distal half of their length.

Ocelli orange-brown, one above the base of each tentacle.

Colour in formalin: umbrella colourless and transparent; gonads pale yellow; ocelli orange-brown.

*Locality.* Inland Sea, Japan.

*Special description.*—The above genus and species are represented by only one specimen. Mr. Gordon Smith has written on the label connected with it, "The only jellyfish of the kind I saw." A detailed description is subjoined.

*Umbrella.* The dimensions are 6.5 centim. in height by 5 centim. in breadth at the upper end and 4.5 (in the contracted specimen) below. The wall has a thickness of 6 millim. in the middle of its length, but only about 3 millim. at the upper end. The eight marginal lobes are 16 millim. broad at the base and 8 millim. in length along the sagittal line; they are slightly curved inwards. The clefts between the lobes pass obliquely upwards and outwards from below, and extend much higher on the outer wall than on the inner, so that only the distal third of the lobe is completely free.

The *tentacles* are about 17 millim. in length. The proximal halves are transparent; the distal halves are opaque and (under a lens) finely granular. The tentacles are attached to the inner aspect of the margin by long slightly narrowed bases, and in such a way that the lower end of the base is flush with the outer surface.

The *velum* is moderately broad; its free edge is, as usual,

\* χρῦσοστέφανος, with golden garland, referring to the festoons of deep orange-coloured ocelli.

circular; its attached edge follows the loops of the circular canal. The breadth of the velum at the angles of the loops is 7 millim., and midway between them, 5 millim.

The *gastric peduncle* is a cuboidal mass about 15 millim. in breadth and height, with rounded radial angles separated by interradian grooves, *i. e.* it is quadrifoliate on transverse section. Two of the segments are prolonged each into a conical stalactitic prolongation about 20 millim. in length, round which are wound the radial canals and gonads. Probably this asymmetry is abnormal, the normal arrangement presenting four prolongations, one in each radial plane.

The *stomach* is 21 millim. in length, the breadth at the base being 5 millim. and at the mouth 15 millim. At each of the four radial angles is a thick muscle-band, which forms a rounded ridge extending from base to orifice. The four sides present many transverse folds. Probably this organ, which is well within the mouth of the umbrella, is capable of being extruded considerably beyond that orifice. The base of the stomach, which projects slightly into the peduncle, shows four radial lines meeting at the centre, these lines being furrows in continuation of the radial canals.

#### *The Gastro-vascular Canals.*

(a) The proximal unbranched portions with gonads. The four radial canals pass from the base of the stomach and proceed across the lower surface of the peduncle. Where the peduncular prolongations occur, the canals form transversely meandrine folds around them from base to apex and down again, and then continue on as similar folds on the radial aspect of the peduncle till they reach the branched gonad-free portion of the radial canals. At the apices of the prolongations, the loops arising from the folding are wound spirally round.

Where the peduncular prolongations do not exist the canals form transverse folds on the distal surface of the peduncle.

(b) The distal branched portions without gonads. The proximal join the distal portions a little beyond the base of the peduncle. The canals are pinnately and alternately branched. At first the lateral branchlets are very close together, straight, at right angles to the main canal, and either unbranched or branched only at their ends; they are given off at gradually increasing distances, and progressively make angles of from  $90^\circ$  to  $60^\circ$  with the main canal. A few of the secondary branches change their lateral course and continue in a longitudinal direction, thus filling the proximal three fourths of the interradian regions. The ends of the vessels are club-shaped and blind, there being no anastomoses.

The four main canals are very narrow at first, and increase slightly in calibre as they proceed. They open into the apices of the four radial angles of the loops of the circular canal.

(c) The circular canal presents eight loops, corresponding with the eight lobes of the umbrella.

(d) The centripetal canals. Four main centripetal canals arise from the interradian angles of the circular canal and branch at acute angles; they occupy the lower fourth of the interradian region; the branches end blindly. A few adradial twigs and diverticula are given off from the circular canal on each side of the main radial and centripetal adradial canals. The central region of the loops is without centripetal canals.

#### *Affinities.*

The position of *Gonomeandrus* is near *Polyorchis*, Agassiz. I had at first thought that the specimen belonged to the Anthomedusæ, because the peduncle was so covered with the folds of the gonads as to conceal its true nature, and I have to thank Mr. E. T. Browne for pointing out to me that this structure was simply a solid gastric peduncle; and when I found that the transverse ridges in the stomach-wall were simply folds, and that no gonads were present in that situation, it became clear that the specimen belonged to the Leptomedusæ. *Gonomeandrus* is distinguished from *Polyorchis* by its possessing transversely-folded gonadial lamellæ in place of pendent filaments, and in having narrow branching secondary canals in place of broad diverticula or simple branches given off from the radial canals.

It is worthy of note that one species of *Polyorchis* possesses a rudimentary gastric peduncle. In the figure of the specimen of *Polyorchis penicillata*, A. Agassiz, given by Fewkes (2. p. 594, pl. xxiii. fig. 3), this organ is shown with gonads dependent from it. Fewkes writes:—"The ovaries hang from the upper portion of the manubrium from a gelatinous elevation or extension of the bell which bears the proboscis." He here considers the presence of ocelli and absence of otocysts of more importance than the position of the gonads, and places the genus in the Anthomedusæ.

#### TRACHOMEDUSÆ.

*Gonionemus Agassizii*, Murbach and Shearer (8. p. 185, pl. xxi. figs. 1, 2, 3). (Pl. XXXIII. figs. 5, 6.)

There are six specimens in varying stages of growth, from Naba Bay. The specimens become relatively much flatter as they increase in size, the smallest being 5×5 millim. in breadth and height and the largest 21×9 millim. The

tentacles, which vary in number from fifty-two to eighty, proceed from the margin at different angles, the direction of the older proceeding in a direction more backwards and upwards than the younger; the radial and interradial tentacles pass through well-marked peronial grooves, roofed over by peronia with closely apposed edges; in the younger tentacles the edges of the peronia do not meet, and in the youngest are not formed at all.

In the Japanese specimens there are more otocysts than tentacles. In one quadrant of the margin I counted thirty otocysts to twenty tentacles.

In their description (*loc. cit.*) of *G. Agassizii*, Murbach and Shearer state that there are not so many otocysts as tentacles, but that there exists no definite regularity. In the twenty intervals between the tentacles of a quadrant I counted the number of otocysts as follows—2 1 2 2 1 1 2 1 2 1 2 1 2 2 1 3 1 0 2 1—*i. e.* 30 in all, mostly alternating as 2 and 1.

Of the four known species of *Gonionemus* one, viz. *G. Murbachii*, Mayer, is found in the Atlantic (at Woods Holl, Mass.), the other three in the Pacific, *G. vertens*, A. Agassiz, occurring off British Columbia, *G. Agassizii*, Murbach and Shearer, off the Aleutian Islands and in the Inland Sea, and *G. suvaensis*, Agassiz and Mayer, off the Fiji Islands.

#### DISCOMEDUSÆ.

*Aurelia aurita*, Linn., var. *japonica*, Kishinouye.

*Aurelia japonica*, Kishinouye (4. pp. 289-291, pl. vii.).

Mr. Gordon Smith's collection contains one specimen of this form, well-preserved, excepting that the arms have been damaged.

I was unable to obtain the volume of the Zool. Mag., Tokyo, containing Kishinouye's description of *Aurelia japonica*, and learned that it was out of print; but Prof. Ijima was so extremely kind as to send me written extracts giving the descriptions of this and other species of *Medusæ* described in the first six volumes. Kishinouye's description runs as follows:—

“Species Diagnosis: Umbrella flat, a little vaulted, 4-5 times as broad as high. Eight velar flaps of the umbrella-margin not protruding; divided by slight shallow incisions only. Mouth-arms a little shorter than the radius of the umbrella; their margins much curled and their proximal halves with broad and strongly folded lobes. Umbrella radius four times the radius of the gonads. At every genital bay 3-5 canal-roots. Sixteen dendritically branching canals form a few meshes only.

"Colour: Transparent and white, the gonads only are slightly rose-coloured.

"Size: Diameter of the umbrella 150 millim. Height 30-35 millim."

The present specimen is 105 millim. broad and 30 millim. thick; the arrangement of its gastrovascular canals is exactly similar to that of the normal typical *A. aurita* found in the Atlantic; three canals proceed from each genital sinus, viz. a trichotomously branched interradial and two simple adradial, the three secondary branches of the interradial originating from a common point on the edge of the sinus; possibly a variation in the breadth of the common centre of origin of these branches leads Kishinouye to give 3-5 as the number of canals originating from the edge of the sinus.

The orifices of the subgenital pits are oval, and  $5 \times 4$  millim. in diameter; the cavities to which they lead stand out more clearly than in the typical *A. aurita*.

In having broad and folded lobes on the proximal halves of the mouth-arms, var. *japonica* differs from the typical *A. aurita*, but therein resembles *A. aurita*, var. *cruciata*, Haeckel, the typical form being "nicht gelappt," and the var. *cruciata* "gelappt" (3. pp. 553, 644). The radius of the umbrella is three times that of the gonads.

If, as Vanhöffen (10. p. 43) and Maas (6. p. 26) assume, *Aurelia colpota*, Brandt, is only a variety of *Aurelia aurita*, then the distribution of *Aurelia aurita* extends over the Atlantic, Indian, and Pacific Oceans.

Nine species of *Aurelia* are described in Haeckel's 'System,' viz. *A. aurita*, Linn.; *cruciata*, Haeckel; *colpota*, Brandt; *flavidula*, Péron and Lesueur; *marginalis*, L. Agassiz; *hyalina*, Brandt; *labiata*, Chamisso and Eysenhardt; *clausa*, Lesson; and *limbata*, Brandt.

The following five have since been described:—

*A. dubia*, Vanhöffen (9. p. 20). Persian Gulf.

*A. habanensis*, Mayer (7. p. 69, pl. xxiv. figs. 3, 4; pl. xxvi. fig. 86). Tortugas and Havana.

*A. japonica*, Kishinouye (4. pp. 289-291, pl. vii.). Inland Sea, Japan.

*A. vitiana*, Agassiz and Mayer (1. p. 171, pl. x. fig. 35). Fiji Islands.

*A. caerulea*, Lendenfeld (5. p. 280). Port Jackson, N.S.W.

Of these five, *A. vitiana* is, according to Maas (6. p. 26), synonymous with *Aurelia aurita*, var. *colpota*, Brandt. *A. dubia*, *habanensis*, and *japonica* may also be regarded as varieties of *Aurelia aurita*. *A. caerulea* belongs to Haeckel's subgenus *Aurelissa*, including *A. limbata*, *labiata*, and *clausa*.

## Literature.

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## EXPLANATION OF PLATE XXXIII.

- Fig. 1.* *Gonomeandrus chrysostephanus*. Nat. size.
- Fig. 2.* The same, laid open. *a*, stomach; *b*, peduncle; *c*, gonads on proximal portion of radial canals; *c'*, roots of four radial canals proceeding from base of stomach; *c''*, a prolongation of peduncle; *c'''*, gonadial filament or diverticulum; *d*, branched portion of radial canal; *e*, circular canal; *f*, a main centripetal circular canal; *g*, velum; *h*, tips of marginal lobes showing below velum.
- Fig. 3.* Diagrammatic transverse section at base of stomach. *a*, base of stomach; *b*, four radial canals; *c*, lobes of peduncle.
- Fig. 4.* Roots of tentacles opening into *a*, the circular canal. One tentacle showing distal portion with nematocyst warts,  $\times 10$  diameters.
- Fig. 5.* *Gonionemus Agassizii*, Murbach and Shearer, edge of umbrella. *a*, edges of peronia; *b*, bulbs rich in large nematocysts, at base of each tentacle; *c*, otocyst.
- Fig. 6.* Otocyst of *G. Agassizii*.  $\times 325$ . *a*, otolith in centre of stalked auditory club and surrounded by partly columnar, partly rounded, endoderm cells; *b*, auditory hairs.

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LXIV.—*Descriptions of new South-American Fishes in the Collection of the British Museum.* By C. TATE REGAN, B.A.

*Pristigaster (Opisthopterus) effulgens.*

Depth of body  $3\frac{3}{4}$  times in the total length, length of head 5 times. Diameter of eye  $3\frac{1}{2}$  times in the length of head and twice the interorbital width. Snout shorter than diameter of